## SEQUENCE LISTING AP20 RGC'd FCT/PTO 22 DEC 2005

<110> Nielsen, Anders Vikso Andersen, Carsten Pedersen, Sven Hjort, Carsten

<120> Starch Process

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<160> 22

<170> PatentIn version 3.3

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Asn Trp Asp Pro Val His Ala Val Gln Met Thr Pro Ser Ser Tyr Pro 35 40 45

Thr Trp Thr Val Thr Ile Pro Leu Leu Gln Gly Gln Asn Ile Gln Phe 50 55 60

Lys Phe Ile Lys Lys Asp Ser Ala Gly Asn Val Ile Trp Glu Asp Ile 65 70 75 80

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Thr Thr Val Ser Leu Pro Gln Gly Lys Ala Ile Glu Phe Lys Phe Ile 50 55 60°

Lys Lys Asp Ser Ala Gly Asn Val Ile Trp Glu Asn Ile Ala Asn Arg 70 75 80

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Thr Trp Val Val Thr Val Pro Leu Pro Gln Ser Gln Asn Ile Gln Phe 50 55 60

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Ser Leu Ala Asn Leu Gly Ile Thr Ala Leu Trp Leu Pro Pro Ala Tyr 35 40 45

Lys Gly Thr Ser Ser Ser Asp Val Gly Tyr Gly Val Tyr Asp Leu Tyr 50 55 60

Asp Leu Gly Glu Phe Asn Gln Lys Gly Thr Val Arg Thr Lys Tyr Gly 65 70 75 80

Thr Lys Thr Gln Tyr Ile Gln Ala Ile Gln Ala Ala His Thr Ala Gly 85 90 95

Met Gln Val Tyr Ala Asp Val Val Phe Asn His Lys Ala Gly Ala Asp 100 105 110

Gly Thr Glu Leu Val Asp Ala Val Glu Val Asn Pro Ser Asp Arg Asn 115 120 125

Gln Glu Ile Ser Gly Thr Tyr Gln Ile Gln Ala Trp Thr Lys Phe Asp 130 135 140

Phe Pro Gly Arg Gly Asn Thr Tyr Ser Ser Phe Lys Trp Arg Trp Tyr 145 150 155 160

His Phe Asp Gly Thr Asp Trp Asp Glu Ser Arg Lys Leu Asn Arg Ile 165 170 175

Tyr Lys Phe Arg Gly Thr Gly Lys Ala Trp Asp Trp Glu Val Asp Thr . Glu Asn Gly Asn Tyr Asp Tyr Leu Met Tyr Ala Asp Leu Asp Met Asp His Pro Glu Val Val Ser Glu Leu Lys Asn Trp Gly Lys Trp Tyr Val Thr Thr Asn Ile Asp Gly Phe Arg Leu Asp Ala Val Lys His Ile Lys Tyr Ser Phe Phe Pro Asp Trp Leu Ser Tyr Val Arg Thr Gln Thr Gln Lys Pro Leu Phe Ala Val Gly Glu Phe Trp Ser Tyr Asp Ile Ser Lys Leu His Asn Tyr Ile Thr Lys Thr Asn Gly Ser Met Ser Leu Phe Asp Ala Pro Leu His Asn Asn Phe Tyr Ile Ala Ser Lys Ser Gly Gly Tyr Phe Asp Met Arg Thr Leu Leu Asn Asn Thr Leu Met Lys Asp Gln Pro Thr Leu Ala Val Thr Leu Val Asp Asn His Asp Thr Glu Pro Gly Gln Ser Leu Gln Ser Trp Val Glu Pro Trp Phe Lys Pro Leu Ala Tyr Ala Phe Ile Leu Thr Arg Gln Glu Gly Tyr Pro Cys Val Phe Tyr Gly Asp Tyr Tyr Gly Ile Pro Lys Tyr Asn Ile Pro Ala Leu Lys Ser Lys Leu Asp Pro Leu Leu Ile Ala Arg Arg Asp Tyr Ala Tyr Gly Thr Gln His Asp Tyr Ile Asp Ser Ala Asp Ile Ile Gly Trp Thr Arg Glu Gly

405 410 415

Val Ala Glu Lys Ala Asn Ser Gly Leu Ala Ala Leu Ile Thr Asp Gly
420 425 430

Pro Gly Gly Ser Lys Trp Met Tyr Val Gly Lys Gln His Ala Gly Lys 435 440 445

Thr Phe Tyr Asp Leu Thr Gly Asn Arg Ser Asp Thr Val Thr Ile Asn 450 455 460

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Ser Ser Leu Ser Ala Leu Gly Ile Thr Ala Leu Trp Leu Pro Pro Ala 35 40 45

Tyr Lys Gly Thr Ser Gln Ala Asp Val Gly Tyr Gly Val Tyr Asp Leu 50 60 .

Tyr Asp Leu Gly Glu Phe Asn Gln Lys Gly Thr Ile Arg Thr Lys Tyr 65 70 75 80

Gly Thr Lys Thr Gln Tyr Leu Gln Ala Ile Gln Ala Ala Lys Ser Ala 85 90 95

Gly Met Gln Val Tyr Ala Asp Val Val Phe Asn His Lys Ala Gly Ala 100 105 110

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Asn	Gln 130	Glu	Thr	Ser	Gly	Thr 135	Tyr	Gln	Ile	Gln	Ala 140	Trp	Thr	Lys	Phe	
Asp 145	Phe	Pro	Gly	Arg	Gly 150	Asn	Thr	Tyr	Ser	Ser 155	Phe	Lys	Trp	Arg	Trp 160	
Tyr	His	Phe	Asp	Gly 165	Thr	Asp	Trp	Asp	Glu 170	Ser	Arg	Lys	Leu	Asn 175	Arg	
Ile	Tyr	Lys	Phe 180	Arg	Gly	Thr	Gly	Lys 185	Ala	Trp	Asp	Trp	Glu 190	Val	Asp	
Thr	Glu	Asn 195	Gly	Asn	Tyr	Asp	Tyr 200	Leu	Met	Phe	Ala	Asp 205	Leu	Asp	Met	
Asp	His 210	Pro	Glu	Val	Val	Ala 215	Glu	Leu	Lys	Asn	Trp 220	Gly	Lys	Trp	Tyr	
Val 225	Asn	Thr	Thr	Asn	Val 230	Asp	Gly	Phe	Arg	Leu 235	Asp	Ala	Val	Lys	His 240	
Ile	Lys	Tyr	Ser	Phe 245	Phe	Pro	Asp	Trp	Leu 250	Ser	Tyr	Val	Arg	Asn 255	Gln	
Thr	Gly	Lys	Asn 260	Leu	Phe	Ala	Val	Gly 265	Glu	Phe	Trp	Gly	Tyr 270	Asp	Val	
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Phe	Asp 290	Ala	Pro	Leu	His	Asn 295	Asn	Phe	Tyr	Ile	Ala 300	Ser	Lys	Ser	Ser	
Gly 305	Tyr	Phe	Asp	Met	Arg 310	Tyr	Leu	Leu	Asn	Asn 315	Thr	Leu	Met	Lys	Asp 320	
Gln	Pro	Ala	Leu	Ala 325	Val	Thr	Leu	Val	Asp 330	Asn	His	Asp	Thr	Gln 335	Pro	

Gly Gln Ser Leu Gln Ser Trp Val Glu Pro Trp Phe Lys Pro Leu Ala 345 Tyr Ala Phe Ile Leu Thr Arg Gln Glu Gly Tyr Pro Cys Val Phe Tyr Gly Asp Tyr Tyr Gly Ile Pro Lys Tyr Asn Ile Pro Gly Leu Lys Ser 375 380 Lys Ile Asp Pro Leu Leu Ile Ala Arg Arg Asp Tyr Ala Tyr Gly Thr 390 395 Gln Arg Asp Tyr Ile Asp His Gln Asp Ile Ile Gly Trp Thr Arg Glu 405 410 Gly Ile Asp Ala Lys Pro Asn Ser Gly Leu Ala Ala Leu Ile Thr Asp 420 425 Gly Pro Gly Gly Ser Lys Trp Met Tyr Val Gly Lys Arg His Ala Gly 435 Lys Val Phe Tyr Asp Leu Thr Gly Asn Arg Ser Asp Thr Val Thr Ile 455 Asn Ala Asp Gly Trp Gly Glu Phe Lys Val Asn Gly Gly Ser Val Ser 470 4.75 Ile Trp Val Ala Lys 485 <210> 6 <211> 484 <212> PRT <213> Alkaliphilic bacillus <400> 6 Gly Ser Val Pro Val Asn Gly Thr Met Met Gln Tyr Phe Glu Trp Tyr 10 Leu Pro Asp Asp Gly Thr Leu Trp Thr Lys Val Ala Asn Asn Ala Gln

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20

Lys Gly Thr Ser Ser Ser Asp Val Gly Tyr Gly Val Tyr Asp Leu Tyr Asp Leu Gly Glu Phe Asn Gln Lys Gly Thr Val Arg Thr Lys Tyr Gly Thr Lys Thr Gln Tyr Ile Gln Ala Ile Gln Ala Ala His Thr Ala Gly Met Gln Val Tyr Ala Asp Val Val Phe Asn His Lys Ala Gly Ala Asp Gly Thr Glu Leu Val Asp Ala Val Glu Val Asn Pro Ser Asp Arg Asn Gln Glu Ile Ser Gly Thr Tyr Gln Ile Gln Ala Trp Thr Lys Phe Asp Phe Pro Gly Arg Gly Asn Thr Tyr Ser Ser Phe Lys Trp Arg Trp Tyr His Phe Asp Gly Thr Asp Trp Asp Glu Ser Arg Lys Leu Asn Arg Ile Tyr Lys Phe Arg Gly Thr Gly Lys Ala Trp Asp Trp Glu Val Asp Thr Glu Asn Gly Asn Tyr Asp Tyr Leu Met Tyr Ala Asp Leu Asp Met Asp His Pro Glu Val Val Ser Glu Leu Lys Asn Trp Gly Lys Trp Tyr Val Ile Thr Thr Asn Ile Asp Gly Phe Arg Leu Asp Ala Val Lys His Ile Lys Tyr Ser Phe Phe Pro Asp Trp Leu Ser Tyr Leu Arg Thr Gln Thr Gln Lys Pro Leu Phe Ala Val Gly Glu Phe Trp Ser Tyr Asp Ile Asn 

280 285 Asp Ala Pro Leu His Asn Asn Phe Tyr Ile Ala Ser Lys Ser Gly Gly 295 Tyr Phe Asp Met Arg Thr Leu Leu Asn Asn Thr Leu Met Lys Glu Gln 305 310 Pro Thr Leu Ser Val Thr Leu Val Asp Asn His Asp Thr Glu Pro Gly 330 Gln Ser Leu Gln Ser Trp Val Glu Pro Trp Phe Lys Pro Leu Ala Tyr 345 Ala Phe Ile Leu Thr Arg Gln Glu Gly Tyr Pro Cys Val Phe Tyr Gly 360 Asp Tyr Tyr Gly Ile Pro Lys Tyr Asn Ile Pro Ala Leu Lys Ser Lys 375 Leu Asp Pro Leu Leu Ile Ala Arg Arg Asp Tyr Ala Tyr Gly Thr Gln 390 400 His Asp Tyr Ile Asp Asn Ala Asp Ile Ile Gly Trp Thr Arg Glu Gly 405 410 415 Val Ala Glu Lys Ala Asn Ser Gly Leu Ala Ala Leu Ile Thr Asp Gly 420 425 Pro Gly Gly Ser Lys Trp Met Tyr Val Gly Lys Gln His Ala Gly Lys 440

Lys Leu His Asn Tyr Ile Thr Lys Thr Asn Gly Ser Met Ser Leu Phe

Thr Phe Tyr Asp Leu Thr Gly Asn Arg Ser Asp Thr Val Thr Ile Asn 450 455 460

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Tyr Leu Pro Asp Asp Gly Thr Leu Trp Thr Lys Val Ala Asn Asn Ala
                        55
Gln Ser Leu Ala Asn Leu Gly Ile Thr Ala Leu Trp Leu Pro Pro Ala
65
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Tyr Asp Leu Gly Glu Phe Asn Gln Lys Gly Thr Val Arg Thr Lys Tyr
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                                105
Gly Thr Lys Thr Gln Tyr Ile Gln Ala Ile Gln Ala Ala His Thr Ala
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                            120
Gly Met Gln Val Tyr Ala Asp Val Val Phe Asn His Lys Ala Gly Ala
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                       135
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145
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Asn Gln Glu Ile Ser Gly Thr Tyr Gln Ile Gln Ala Trp Thr Lys Phe
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Asp Phe Pro Gly Arg Gly Asn Thr Tyr Ser Ser Phe Lys Trp Arg Trp
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Tyr His Phe Asp Gly Thr Asp Trp Asp Glu Ser Arg Lys Leu Asn Arg

200

Ile	Tyr 210	Lys	Phe	Arg	Gly	Thr 215		Lys	Ala	Trp	Asp 220	Trp	Glu	Val	Asp
Thr 225	Glu	Asn	Gly	Asn	Tyr 230	Asp	Tyr	Leu	Met	Tyr 235	Ala	Asp	Leu	Asp	Met 240
Asp	His	Pro	Glu	Val 245	Val	Ser	Glu	Leu	Lys 250	Asn	Trp	Gly	Lys	Trp 255	Tyr
Val	Thr	Thr	Thr 260	Asn	Ile	Asp	Gly	Phe 265	Arg	Leu	Asp	Ala	Val 270	Lys	His
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Ser 305	Lys	Leu	His	Asn	Tyr 310	Ile	Thr	Lys	Thr	Asn 315	Gly	Ser	Met	Ser	Leu 320
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Gln	Pro	Thr 355	Leu	Ala	Val	Thr	Leu 360	Val	Asp	Asn	His	Asp 365	Tḥr	Glu	Pro
Gly	Gln 370	Ser	Leu	Gln	Ser	Trp 375	Val	Glu	Pro	Trp	Phe 380	Lys	Pro	Leu	Ala
Tyr 385	Ala	Phe	Ile	Leu	Thr 390	Arg	Gln	Glu	Gly	Tyr 395	Pro	Cys	Val	Phe	Tyr 400
Gly	Asp	Tyr	Tyr	Gly 405	Ile	Pro	Lys	Tyr	Asn 410	Ile	Pro	Ala	Leu	Lys 415	Ser
Lys	Leu	Asp	Pro 420	Leu	Leu	Ile	Ala	Arg 425	Arg	Asp	Tyr	Ala	Tyr 430	Gly	Thr

Gln His Asp Tyr Ile Asp Ser Ala Asp Ile Ile Gly Trp Thr Arg Glu
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440
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Gly Pro Gly Gly Ser Lys Trp Met Tyr Val Gly Lys Gln His Ala Gly 465 470 475 480

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Tyr Leu Pro Asp Asp Gly Thr Leu Trp Thr Lys Val Ala Asn Asn Ala 50 55 60

Gln Ser Leu Ala Asn Leu Gly Ile Thr Ala Leu Trp Leu Pro Pro Ala 65 70 75 80

Tyr Lys Gly Thr Ser Ser Ser Asp Val Gly Tyr Gly Val Tyr Asp Leu 85 90 95

Tyr Asp Leu Gly Glu Phe Asn Gln Lys Gly Thr Val Arg Thr Lys Tyr Gly Thr Lys Thr Gln Tyr Ile Gln Ala Ile Gln Ala Ala His Thr Ala Gly Met Gln Val Tyr Ala Asp Val Val Phe Asn His Lys Ala Gly Ala Asp Gly Thr Glu Leu Val Asp Ala Val Glu Val Asn Pro Ser Asp Arg Asn Gln Glu Ile Ser Gly Thr Tyr Gln Ile Gln Ala Trp Thr Lys Phe Asp Phe Pro Gly Arg Gly Asn Thr Tyr Ser Ser Phe Lys Trp Arg Trp Tyr His Phe Asp Gly Thr Asp Trp Asp Glu Ser Arg Lys Leu Asn Arg Ile Tyr Lys Phe Arg Gly Thr Gly Lys Ala Trp Asp Trp Glu Val Asp Thr Glu Asn Gly Asn Tyr Asp Tyr Leu Met Tyr Ala Asp Leu Asp Met Asp His Pro Glu Val Val Ser Glu Leu Lys Asn Trp Gly Lys Trp Tyr Val Thr Thr Asn Ile Asp Gly Phe Arg Leu Asp Ala Val Lys His Ile Lys Tyr Ser Phe Phe Pro Asp Trp Leu Ser Tyr Val Arg Thr Gln Thr Gln Lys Pro Leu Phe Ala Val Gly Glu Phe Trp Ser Tyr Asp Ile Asn Lys Leu His Asn Tyr Ile Thr Lys Thr Asn Gly Ser Met Ser Leu 

Phe Asp Ala Pro Leu His Asn Asn Phe Tyr Ile Ala Ser Lys Ser Gly Gly Tyr Phe Asp Met Arg Thr Leu Leu Asn Asn Thr Leu Met Lys Asp Gln Pro Thr Leu Ser Val Thr Leu Val Asp Asn His Asp Thr Glu Pro Gly Gln Ser Leu Gln Ser Trp Val Glu Pro Trp Phe Lys Pro Leu Ala Tyr Ala Phe Ile Leu Thr Arg Gln Glu Gly Tyr Pro Cys Ile Phe Tyr Gly Asp Tyr Tyr Gly Ile Pro Lys Tyr Asn Ile Pro Ala Leu Lys Ser Lys Leu Asp Pro Leu Leu Ile Ala Arg Arg Asp Tyr Ala Tyr Gly Thr Gln His Asp Tyr Ile Asp Asn Ala Asp Ile Ile Gly Trp Thr Arg Glu Gly Val Ala Glu Lys Ala Asn Ser Gly Leu Ala Ala Leu Ile Thr Asp Gly Pro Gly Gly Ser Lys Trp Met Tyr Val Gly Lys Gln His Ala Gly Lys Thr Phe Tyr Asp Leu Thr Gly Asn Arg Ser Asp Thr Val Thr Ile Asn Ala Asp Gly Trp Gly Glu Phe Lys Val Asn Gly Gly Ser Val Ser Ile Trp Val Pro Lys Thr Ser Thr Thr Ser Gln Ile Thr Phe Thr Val Asn Asn Ala Thr Thr Val Trp Gly Gln Asn Val Tyr Val Val Gly Asn 

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Gly	Asn	Tyr 195	Asp	Tyr	Leu	Met	Phe 200	Ala	Asp	Leu	Asp	Met 205	Asp	His	Pro
Glu	Val 210	Val	Thr	Glu	Leu	Lys 215	Asn	Trp	Gly	Lys	Trp 220	Tyr	Val	Asn	Thr
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Ser	Phe	Phe	Pro	Asp 245	Trp	Leu	Thr	Tyr	Val 250	Arg	Asn	Gln	Thr	Gly 255	Lys
Asn	Leu	Phe	Ala 260	Val	Gly	Glu	Phe	Trp 265	Ser	Tyr	Asp	Val	Asn 270	Lys	Leu
His	Asn	Tyr 275	Ile	Thr	Lys	Thr	Asn 280	Gly	Ser	Met	Ser	Leu 285	Phe	Asp	Ala
Pro	Leu 290	His	Asn	Asn	Phe	Tyr 295	Ile	Ala	Ser	Lys	Ser 300	Ser	Gly	Tyr	Phe
Asp 305	Met	Arg	Tyr	Leu	Leu 310	Asn	Asn	Thr	Leu	Met 315	Lys	Asp	Gln	Pro	Ser 320
Leu	Ala	Val	Thr	Leu 325	Val	Asp	Asn	His	Asp 330	Thr	Gln	Pro	Gly	Gln 335	Ser
Leu	Gln	Ser	Trp 340	Val	Glu	Ala	Trp	Phe 345	Lys	Pro	Leu	Ala	Tyr 350	Ala	Phe
Ile	Leu	Thr 355	Arg	Gln	Glu	Gly	Tyr 360	Pro	Cys	Val	Phe	Tyr 365	Gly	Asp	Tyr
Tyr	Gly 370	Ile	Pro	Lys	Tyr	Asn 375	Ile	Pro	Gly	Leu	Lys 380	Ser	Lys	Ile	Asp
Pro 385	Leu	Leu	Ile	Ala	Arg 390	Arg	Asp	Tyr	Ala	Tyr 395	Gly	Thr	Gln	Arg	Asp

Tyr Ile Asp His Gln Asp Ile Ile Gly Trp Thr Arg Glu Gly Ile Asp 405 410 415

Ala Lys Pro Asn Ser Gly Leu Ala Ala Leu Ile Thr Asp Gly Pro Gly 420 425 430

Gly Ser Lys Trp Met Tyr Val Gly Lys Lys His Ala Gly Lys Val Phe 435 440 445

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Gly Glu Phe Asn Gln Lys Gly Thr Ile Arg Thr Lys Tyr Gly Thr Lys 65 70 75 80

Thr Gln Tyr Ile Gln Ala Ile Gln Thr Ala Gln Ala Ala Gly Met Gln
85 90 95

Val	Tyr	Ala	Asp 100	Val	Val	Phe	Asn	His 105	Lys	Ala	Gly	Ala	Asp 110	Ser	Thr
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Asp	Gly	Thr	Asp	Trp 165	Asp	Glu	Ser	Arg	Lys 170	Leu	Asn	Arg	Ile	Tyr 175	Lys
Phe	Arg	Gly	Thr 180	Gly	Lys	Ala	Trp	Asp 185	Trp	Glu	Val	Asp	Thr 190	Glu	Asn
Gly	Asn	Tyr 195	Asp	Tyr	Leu	Met	Phe 200	Ala	Asp	Leu	Asp	Met 205	Asp	His	Pro
Glu	Val 210	Val	Thr	Glu	Leu	Lys 215	Asn	Trp	Gly	Thr	Trp 220	Tyr	Val	Asn	Thr
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Pro	Leu 290	His	Asn	Asn	Phe	Tyr 295	Thr	Ala	Ser	Lys	Ser 300	Ser	Gly	Tyr	Phe
Asp 305	Met	Arg	Tyr	Leu	Leu 310	Asn	Asn	Thr	Leu	Met 315	Lys	Asp	Gln	Pro	Ser 320

Leu Ala Val Thr Leu Val Asp Asn His Asp Thr Gln Pro Gly Gln Ser 325 Leu Gln Ser Trp Val Glu Pro Trp Phe Lys Gln Leu Ala Tyr Ala Phe 345 Ile Leu Thr Arg Gln Glu Gly Tyr Pro Cys Val Phe Tyr Gly Asp Tyr 360 Tyr Gly Ile Pro Lys Tyr Asn Ile Pro Gly Leu Lys Ser Lys Ile Asp 370 375 Pro Leu Leu Ile Ala Arg Arg Asp Tyr Ala Tyr Gly Thr Gln Arg Asp 385 390 395 Tyr Ile Asp His Gln Asp Ile Ile Gly Trp Thr Arg Glu Gly Ile Asp 405 410 Ala Lys Pro Asn Ser Gly Leu Ala Ala Leu Ile Thr Asp Gly Pro Gly Gly Ser Lys Trp Met Tyr Val Gly Lys Lys His Ala Gly Lys Val Phe 440 Tyr Asp Leu Thr Gly Asn Arg Ser Asp Thr Val Thr Ile Asn Ala Asp 450 455 460 Gly Trp Gly Glu Phe Lys Val Asn Gly Gly Ser Val Ser Ile Trp Val 465 470 475 Ala Lys <210> 11 <211> 482 <212> PRT <213> Unknown <220>

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ser	rne	rne	PIO	245	Trp	ren	Thr	ніѕ	250	Arg	ser	GIN	Tnr	255	ьys
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His	Asn	Tyr 275	Ile	Thr	Lys	Thr	Ser 280	Gly	Thr	Met	Ser	Leu 285	Phe	Asp	Ala
Pro	Leu 290	His	Asn	Asn	Phe	Tyr 295	Thr	Ala	Ser	Lys	Ser 300	Ser	Gly	Tyr	Phe
Asp 305	Met	Arg	Tyr	Leu	Leu 310	Asn	Asn	Thr	Leu	Met 315	Lys	Asp	Gln	Pro	Ser 320
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Tyr	Gly 370	Ile	Pro	Lys	Tyr	Asn 375	Ile	Pro	Gly	Leu	Lys 380	Ser	Lys	Ile	Asp
Pro 385	Leu	Leu	Ile	Ala	Arg 390	Arg	Asp	Tyr	Ala	Tyr 395	Gly	Thr	Gln	Arg	Asp 400
Tyr	Ile	Asp	His	Gln 405	Asp	Ile	Ile	Gly	Trp 410	Thr	Arg	Glu	Gly	Ile 415	Asp
Ser	Lys	Pro	Asn 420	Ser	Gly	Leu	Ala	Ala 425	Leu	Ile	Thr	Asp	Gly 430	Pro	Gly
Gly	Ser	Lys 435	Trp	Met	Tyr	Val	Gly 440	Lys	Lys	His	Ala	Gly 445	Lys	Val	Phe
Tyr	Asp 450	Leu	Thr	Gly	Asn	Arg 455	Ser	Asp	Thr	Val	Thr 460	Ile	Asn	Ala	Asp
Gly	grT	Glv	Glu	Phe	Lvs	Val	Asn	Glv	Glv	Ser	Val	Ser	Ile	Trp	Val

465 470 475 480

Ala Lys

<210> 12

<211> 482

<212> PRT

<213> Unknown

<220>

<223> Source unknown

<400> 12

Ala Pro Val Asn Gly Thr Met Met Gln Tyr Phe Glu Trp Asp Leu Pro  $1 \hspace{1cm} 5 \hspace{1cm} 10 \hspace{1cm} 15$ 

Asn Asp Gly Thr Leu Trp Thr Lys Val Lys Asn Glu Ala Ser Ser Leu 20 25 30

Ser Ser Leu Gly Ile Thr Ala Leu Trp Leu Pro Pro Ala Tyr Lys Gly 35 40 45

Thr Ser Gln Gly Asp Val Gly Tyr Gly Val Tyr Asp Leu Tyr Asp Leu 50 55 60

Gly Glu Phe Asn Gln Lys Gly Thr Ile Arg Thr Lys Tyr Gly Thr Lys 65 70 75 80

Thr Gln Tyr Leu Gln Ala Ile Gln Ala Ala Lys Ser Ala Gly Met Gln 85 90 95

Val Tyr Ala Asp Val Val Phe Asn His Lys Ala Gly Ala Asp Ser Thr 100 105 110

Glu Trp Val Asp Ala Val Glu Val Asn Pro Ser Asn Arg Asn Gln Glu 115 120 125

Thr Ser Gly Thr Tyr Gln Ile Gln Ala Trp Thr Lys Phe Asp Phe Pro 130 135 140

Asp Arg Gly Asn Thr Tyr Ser Ser Phe Lys Trp Arg Trp Tyr His Phe 145 150 155 160

Asp	Gly	Thr	Asp	Trp 165	Asp	Glu	Ser	Arg	Lys 170	Leu	Asn	Arg	Ile	Tyr 175	Lys
Phe	Arg	Gly	Thr 180	Gly	Lys	Ala	Trp	Asp 185	Trp	Glu	Val	Asp	Thr 190	Glu	Asn
Gly	Asn	Tyr 195	Asp	Tyr	Leu	Met	Phe 200	Ala	Asp	Leu	Asp	Met 205	Asp	His	Pro
Glu	Val 210	Val	Thr	Glu	Leu	Lys 215	Asn	Trp	Gly	Thr	Trp 220	Tyr	Val	Asn	Thr
Thr 225	Asn	Val	Asp	Gly	Phe 230	Arg	Leu	Asp	Ala	Val 235	Lys	His	Ile	Lys	Tyr 240
Ser	Phe	Phe	Pro	Asp 245	Trp	Leu	Thr	Tyr	Val 250	Arg	Ser	Gln	Thr	Gln 255	Lys
Asn	Leu	Phe	Ala 260	Val	Gly	Glu	Phe	Trp 265	Ser	Tyr	Asp	Val	Asn 270	Lys	Leu
His	Asn	Tyr 275	Ile	Thr	Lys	Thr	Ser 280	Gly	Thr	Met	Ser	Leu 285	Phe	Asp	Ala
Pro	Leu 290	His	Asn	Asn	Phe	Tyr 295	Thr	Ala	Ser	Lys	Ser 300	Ser	Gly	Tyr	Phe
Asp 305	Met	Arg	Tyr	Leu	Leu 310	Asn	Asn	Thr	Leu	Met 315	Lys	Asp	Gln	Pro	Ser 320
Leu	Ala	Val	Thr	Leu 325	Val	Asp	Asn	His	Asp 330	Thr	Gln	Pro	Gly	Gln 335	Ser
Leu	Gln	Ser	Trp 340	Val	Glu	Pro	Trp	Phe 345	Lys	Pro	Leu	Ala	Tyr 350	Ala	Phe
Ile	Leu	Thr 355	Arg	Gln	Glu	Gly	Tyr 360	Pro	Cys	Val	Phe	Tyr 365	Gly	Asp	Tyr
Tyr	Gly 370	Ile	Pro	Lys	Tyr	Asn 375	Ile	Pro	Gly	Leu	Lys 380	Ser	Lys	Ile	Asp
Pro	Leu	Leu	Ile	Ala	Arg	Arg	Asp	Tyr	Ala	Tyr	Gly	Thr	Gln	Arg	Asp

Tyr Ile Asp His Gln Asp Ile Ile Gly Trp Thr Arg Glu Gly Ile Asp 405 410 415

Ser Lys Pro Asn Ser Gly Leu Ala Ala Leu Ile Thr Asp Gly Pro Gly 420 425 430

Gly Ser Lys Trp Met Tyr Val Gly Lys Lys His Ala Gly Lys Val Phe
435 440 445

Tyr Asp Leu Thr Gly Asn Arg Ser Asp Thr Val Thr Ile Asn Ala Asp 450 455 460

Gly Trp Gly Glu Phe Lys Val Asn Gly Gly Ser Val Ser Ile Trp Val 465 470 475 480

Ala Lys

<210> 13

<211> 483

<212> PRT

<213> Bacillus licheniformis

<400> 13

Ala Asn Leu Asn Gly Thr Leu Met Gln Tyr Phe Glu Trp Tyr Met Pro  $1 \hspace{1cm} 5 \hspace{1cm} 10 \hspace{1cm} 15$ 

Asn Asp Gly Gln His Trp Arg Arg Leu Gln Asn Asp Ser Ala Tyr Leu 20 25 30

Ala Glu His Gly Ile Thr Ala Val Trp Ile Pro Pro Ala Tyr Lys Gly 35 40 45

Thr Ser Gln Ala Asp Val Gly Tyr Gly Ala Tyr Asp Leu Tyr Asp Leu 50 55 60

Gly Glu Phe His Gln Lys Gly Thr Val Arg Thr Lys Tyr Gly Thr Lys 65 70 75 80

Gly Glu Leu Gln Ser Ala Ile Lys Ser Leu His Ser Arg Asp Ile Asn 85 90 95

Val	Tyr	Gly	Asp 100	Val	Val	Ile	Asn	His 105		Gly	Gly	Ala	Asp 110		Thi
Glu	Asp	Val 115	Thr	Ala	Val	Glu	Val 120	Asp	Pro	Ala	Asp	Arg 125	Asn	Arg	Va]
Ile	Ser 130	Gly	Glu	His	Leu	Ile 135	Lys	Ala	Trp	Thr	His 140	Phe	His	Phe	Pro
Gly 145	Arg	Ģly	Ser	Thr	Tyr 150	Ser	Asp	Phe	Lys	Trp 155	His	Trp	Tyr	His	Phe 160
Asp	Gly	Thr	Asp	Trp 165	Asp	Glu	Ser	Arg	Lys 170	Leu	Asn	Arg	Ile	Tyr 175	Lys
Phe	Gln	Gly	Lys 180	Ala	Trp	Asp	Trp	Glu 185	Val	Ser	Asn	Glu	Asn 190	Gly	Asn
Tyr	Asp	Tyr 195	Leu	Met	Tyr	Ala	Asp 200	Ile	Asp	Tyr	Asp	His 205	Pro	Asp	Val
Ala	Ala 210	Glu	Ile	Lys	Arg	Trp 215	Gly	Thr	Trp	Tyr	Ala 220	Asn	Glu	Leu	Gln
Leu 225	Asp	Gly	Phe	Arg	Leu 230	Asp	Ala	Val	Lys	His 235	Ile	Lys	Phe	Ser	Phe 240
Leu	Arg	Asp	Trp	Val 245	Asn	His	Val	Arg	Glu 250	Lys	Thr	Gly	Lys	Glu 255	Mėt
Phe	Thr	Val	Ala 260	Glu	Tyr	Trp	Gln	Asn 265	Asp	Leu	Gly	Ala	Leu 270	Glu	Asn
Tyr	Leu	Asn 275	Lys	Thr	Asn	Phe	Asn 280	His	Ser	Val	Phe	Asp 285	Val	Pro	Leu
His	Tyr 290	Gln	Phe	His	Ala	Ala 295	Ser	Thr	Gln	Gly	Gly 300	Gly	Tyr	Asp	Met
Arg 305	Lys	Leu	Leu	Asn	Gly 310	Thr	Val	Val	Ser	Lys	His	Pro	Leu	Lys	Ser

Val Thr Phe Val Asp Asn His Asp Thr Gln Pro Gly Gln Ser Leu Glu 325 Ser Thr Val Gln Thr Trp Phe Lys Pro Leu Ala Tyr Ala Phe Ile Leu 345 Thr Arg Glu Ser Gly Tyr Pro Gln Val Phe Tyr Gly Asp Met Tyr Gly 360 Thr Lys Gly Asp Ser Gln Arg Glu Ile Pro Ala Leu Lys His Lys Ile 370 375 Glu Pro Ile Leu Lys Ala Arg Lys Gln Tyr Ala Tyr Gly Ala Gln His 385 390 Asp Tyr Phe Asp His His Asp Ile Val Gly Trp Thr Arg Glu Gly Asp 405 410 415 Ser Ser Val Ala Asn Ser Gly Leu Ala Ala Leu Ile Thr Asp Gly Pro Gly Gly Ala Lys Arg Met Tyr Val Gly Arg Gln Asn Ala Gly Glu Thr 440 Trp His Asp Ile Thr Gly Asn Arg Ser Glu Pro Val Val Ile Asn Ser 450 455 Glu Gly Trp Gly Glu Phe His Val Asn Gly Gly Ser Val Ser Ile Tyr 465 470 475 Val Gln Arg <210> 14 <211> 483 <212> PRT <213> Bacillus amyloliquefacience <400> 14 Val Asn Gly Thr Leu Met Gln Tyr Phe Glu Trp Tyr Thr Pro Asn Asp

10

.Gly Gln His Trp Lys Arg Leu Gln Asn Asp Ala Glu His Leu Ser Asp

25

116	Gly	35	1111	Ald	Vai	ırþ	40	PLO	PLO	АІА	ıyr	45	стх	Leu	,ser
Gln	Ser 50	Asp	Asn	Gly	Tyr	Gly 55	Pro	Tyr	Asp	Ĺeu	Tyr 60	Asp	Leu	Gly	Glu
Phe 65	Gln	Gln	Lys	Gly	Thr 70	Val	Arg	Thr	Lys	Tyr 75	Gly	Thr	Lys	Ser	Glu 80
Leu	Gln	Asp	Ala	Ile 85	Gly	Ser	Leu	His	Ser 90	Arg	Asn	Val	Gln	Val 95	Tyr
Gly	Asp	Val	Val 100	Leu	Asn	His	Lys	Ala 105	Gly	Ala	Asp	Ala	Thr 110	Glu	, Asp
Val	Thr	Ala 115	Val	Glu	Val	Asn	Pro 120	Ala	Asn	Arg	Asn	Gln 125	Glu	Thr	Ser
Glu	Glu 130	Tyr	Gln	Ile	Lys	Ala 135	Trp	Thr	Asp	Phe	Arg 140	Phe	Pro	Gly	Arg
Gly 145	Asn	Thr	Tyr	Ser	Asp 150	Phe	Lys	Trp	His	Trp 155	Tyr	His	Phe	Asp	Gly 160
Ala	Asp	Trp	Asp	Glu 165	Ser	Arg	Lys	Ile	Ser 170	Arg	Ile	Phe	Lys	Phe 175	Arg
Gly	Glu	Gly	Lys 180	Ala	Trp	Asp	Trp	Glu 185	Val	Ser	Ser	Glu	Asn 190	Gly	Asn
Tyr	Asp	Tyr 195	Leu	Met	Tyr	Ala	Asp 200	Val	Asp	Tyr	Asp	His 205	Pro	Asp	Val
Val	Ala 210	Glu	Thr	Lys	Lys	Trp 215	Gly	Ile	Trp	Tyr	Ala 220	Asn	Glu	Leu	Ser
Leu 225	Asp	Gly	Phe	Arg	Ile 230	Asp	Ala	Ala	Lys	His 235	Ile	Lys	Phe	Ser	Phe 240
Leu	Arg	Asp	Trp	Val 245	Gln	Ala	Val	Arg	Gln 250	Ala	Thr	Gly	Lys	Glu 255	Met

Phe Thr Val Ala Glu Tyr Trp Gln Asn Asn Ala Gly Lys Leu Glu Asn Tyr Leu Asn Lys Thr Ser Phe Asn Gln Ser Val Phe Asp Val Pro Leu His Phe Asn Leu Gln Ala Ala Ser Ser Gln Gly Gly Tyr Asp Met Arg Arg Leu Leu Asp Gly Thr Val Val Ser Arg His Pro Glu Lys Ala Val Thr Phe Val Glu Asn His Asp Thr Gln Pro Gly Gln Ser Leu Glu Ser Thr Val Gln Thr Trp Phe Lys Pro Leu Ala Tyr Ala Phe Ile Leu Thr Arg Glu Ser Gly Tyr Pro Gln Val Phe Tyr Gly Asp Met Tyr Gly Thr Lys Gly Thr Ser Pro Lys Glu Ile Pro Ser Leu Lys Asp Asn Ile Glu Pro Ile Leu Lys Ala Arg Lys Glu Tyr Ala Tyr Gly Pro Gln His Asp Tyr Ile Asp His Pro Asp Val Ile Gly Trp Thr Arg Glu Gly Asp Ser Ser Ala Ala Lys Ser Gly Leu Ala Ala Leu Ile Thr Asp Gly Pro Gly Gly Ser Lys Arg Met Tyr Ala Gly Leu Lys Asn Ala Gly Glu Thr Trp Tyr Asp Ile Thr Gly Asn Arg Ser Asp Thr Val Lys Ile Gly Ser Asp Gly Trp Gly Glu Phe His Val Asn Asp Gly Ser Val Ser Ile Tyr 

Val Gln Lys

<210> 15 <211> 483 <212> PRT <213> Bacillus stearothermophilus <400> 15

Ala Ala Pro Phe Asn Gly Thr Met Met Gln Tyr Phe Glu Trp Tyr Leu

1 10 15

Pro Asp Asp Gly Thr Leu Trp Thr Lys Val Ala Asn Glu Ala Asn Asn 20 25 30

Leu Ser Ser Leu Gly Ile Thr Ala Leu Trp Leu Pro Pro Ala Tyr Lys
35 40 45

Gly Thr Ser Arg Ser Asp Val Gly Tyr Gly Val Tyr Asp Leu Tyr Asp 50 55 60

Leu Gly Glu Phe Asn Gln Lys Gly Thr Val Arg Thr Lys Tyr Gly Thr 65 70 75 80

Lys Ala Gln Tyr Leu Gln Ala Ile Gln Ala Ala His Ala Ala Gly Met 85 90 95

Gln Val Tyr Ala Asp Val Val Phe Asp His Lys Gly Gly Ala Asp Gly 100 105 110

Thr Glu Trp Val Asp Ala Val Glu Val Asn Pro Ser Asp Arg Asn Gln
115 120 125

Glu Ile Ser Gly Thr Tyr Gln Ile Gln Ala Trp Thr Lys Phe Asp Phe 130 135 140

Pro Gly Arg Gly Asn Thr Tyr Ser Ser Phe Lys Trp Arg Trp Tyr His 145 150 155 160

Phe Asp Gly Val Asp Trp Asp Glu Ser Arg Lys Leu Ser Arg Ile Tyr 165 170 175

Lys Phe Arg Gly Ile Gly Lys Ala Trp Asp Trp Glu Val Asp Thr Glu 180 185 190

Asn	Gly	Asn 195	Tyr	Asp	Tyr	Leu	Met 200	Tyr	Ala	Asp	Leu	Asp 205	Met	Asp	Ḥi,s
Pro	Glu 210	Val	Val	Thr	Glu	Leu 215	Lys	Asn	Trp	Gly	Lys 220	Trp	Tyr	Val	Asn
Thr 225	Thr	Asn	Ile	Asp	Gly 230	Phe	Arg	Leu	Asp	Ala 235	Val	Lys	His	Ile	Lys 240
Phe	Ser	Phe	Phe	Pro 245	Asp	Trp	Leu	Ser	Tyr 250	Val	Arg	Ser	Gln	Thr 255	Gly
Lys	Pro	Leu	Phe 260	Thr	Val	Gly	Glu	Tyr 265	Trp	Ser	Tyr	Asp	Ile 270	Asn	Lys
Leu	His	Asn 275	Tyr	Ile	Thr	Lys	Thr 280	Asn	Gly	Thr	Met	Ser 285	Leu	Phe	Asp
Ala	Pro 290	Leu	His	Asn	Lys	Phe 295	Tyr	Thr	Ala	Ser	Lys 300	Ser	Gly	Gly	Ala
Phe 305	Asp	Met	Arg	Thr	Leu 310	Met	Thr	Asn	Thr	Leu 315	Met	Lys	Asp	Gln	Pro 320
Thr	Leu	Ala	Val	Thr 325	Phe	Val	Asp	Asn	His 330	Asp	Thr	Glu	Pro	Gly 335	Gln
Ala	Leu	Gln	Ser 340	Trp	Val	Asp	Pro	Trp 345	Phe	Lys	Pro	Leu	Ala 350	Tyr	Ala
Phe	Ile	Leu 355	Thr	Arg	Gln	Glu	Gly 360	Tyr	Pro	Cys	Val	Phe 365	Tyr	Gly	Asp
Tyr	Tyr 370	Gly	Ile	Pro	Gln	Tyr 375	Asn	Ile	Pro	Ser	Leu 380	Lys	Ser	Lys	Ile
Asp 385	Pro	Leu	Leu	Ile	Ala 390	Arg	Arg	Asp	Tyr	Ala 395	Tyr	Gly	Thr	Gln	His 400
Asp	Tyr	Leu	Asp	His 405	Ser	Asp	Ile	Ile	Gly 410	Trp	Thr	Arg	Glu	Gly 415	Val

Thr Glu Lys Pro Gly Ser Gly Leu Ala Ala Leu Ile Thr Asp Gly Pro 420 425 430

Gly Gly Ser Lys Trp Met Tyr Val Gly Lys Gln His Ala Gly Lys Val 435 440 445

Phe Tyr Asp Leu Thr Gly Asn Arg Ser Asp Thr Val Thr Ile Asn Ser 450 455 460

Asp Gly Trp Gly Glu Phe Lys Val Asn Gly Gly Ser Val Ser Val Trp 465 470 475 480

Val Pro Arg

<210> 16

<211> 485

<212> PRT

<213> Unknown

<220>

<223> Source unknown

<400> 16

His His Asn Gly Thr Asn Gly Thr Met Met Gln Tyr Phe Glu Trp Tyr 1  $\phantom{000}$  5  $\phantom{000}$  10  $\phantom{000}$  15

Leu Pro Asn Asp Gly Asn His Trp Asn Arg Leu Arg Ser Asp Ala Ser 20 25 30

Asn Leu Lys Asp Lys Gly Ile Ser Ala Val Trp Ile Pro Pro Ala Trp 35 40 45

Lys Gly Ala Ser Gln Asn Asp Val Gly Tyr Gly Ala Tyr Asp Leu Tyr 50 55 60

Asp Leu Gly Glu Phe Asn Gln Lys Gly Thr Ile Arg Thr Lys Tyr Gly 65 70 75 80

Thr Arg Asn Gln Leu Gln Ala Ala Val Asn Ala Leu Lys Ser Asn Gly 85 90 95

Ile Gln Val Tyr Gly Asp Val Val Met Asn His Lys Gly Gly Ala Asp 100 105 110

Ala	Thr	Glu 115	Met	Val	Arg	Ala	Val 120	Glu	Val	Asn	Pro	Asn 125	Asn	Arg	Äsn
Gln	Glu 130	Val	Ser	Gly	Glu	Tyr 135	Thr	Ile	Glu	Ala	Trp 140	Thr	Lys	Phe	Asp
Phe 145	Pro	Gly	Arg	Gly	Asn 150	Thr	His	Ser	Asn	Phe 155	Lys	Trp	Arg	Trp	Tyr 160
His	Phe	Asp	Gly	Val 165	Asp	Trp	Asp	Gln	Ser 170	Arg	Lys	Leu	Asn	Asn 175	Arg
Ile	Tyr	Lys	Phe 180	Arg	Gly	Asp	Gly	Lys 185	Gly	Trp	Asp	Trp	Glu 190	Val	Asp
Thr	Glu	Asn 195	Gly	Asn	Tyr	Asp	Tyr 200	Leu	Met	Tyr	Ala	Asp 205	Ile	Asp	Met
Asp	His 210	Pro	Glu	Val	Val	Asn 215	Glu	Leu	Arg	Asn	Trp 220	Gly	Val	Trp	Tyr
Thr 225	Asn	Thr	Leu	Gly	Leu 230	Asp	Gly	Phe	Arg	Ile 235	Asp	Ala	Val	Lys	His 240
Ile	Lys	Tyr	Ser	Phe 245	Thr	Arg	Asp	Trp	Ile 250	Asn	His	Val	Arg	Ser 255	Ala
Thr	Gly	Lys	Asn 260	Met	Phe	Ala	Val	Ala 265	Glu	Phe	Trp	Lys	Asn 270	Asp	Leu
Gly	Ala	Ile 275	Glu	Asn	Tyr	Leu	Asn 280	Lys	Thr	Asn	Trp	Asn 285	His	Ser	Val
Phe	Asp 290	Val	Pro	Leu	His	Tyr 295	Asn	Leu	Tyr	Asn	Ala 300	Ser	Lys	Ser	Gly ·
Gly 305	Asn	Tyr	Asp	Met	Arg 310	Gln	Ile	Phe	Asn	Gly 315	Thr	Val	Val	Gln	Arg 320
His	Pro	Met	His	Ala 325	Val	Thr	Phe	Val	Asp 330	Asn	His	Asp	Ser	Gln 335	Pro

Glu Glu Ala Leu Glu Ser Phe Val Glu Glu Trp Phe Lys Pro Leu Ala 340 345 350 Tyr Ala Leu Thr Leu Thr Arg Glu Gln Gly Tyr Pro Ser Val Phe Tyr 355 360 Gly Asp Tyr Tyr Gly Ile Pro Thr His Gly Val Pro Ala Met Lys Ser 370 375 Lys Ile Asp Pro Ile Leu Glu Ala Arg Gln Lys Tyr Ala Tyr Gly Arg 385 Gln Asn Asp Tyr Leu Asp His His Asn Ile Ile Gly Trp Thr Arg Glu 410 Gly Asn Thr Ala His Pro Asn Ser Gly Leu Ala Thr Ile Met Ser Asp 420 425 Gly Ala Gly Gly Asn Lys Trp Met Phe Val Gly Arg Asn Lys Ala Gly 435 440 Gln Val Trp Thr Asp Ile Thr Gly Asn Arg Ala Gly Thr Val Thr Ile 450 455 Asn Ala Asp Gly Trp Gly Asn Phe Ser Val Asn Gly Gly Ser Val Ser 465 470 480 Ile Trp Val Asn Lys 485 <210> 17 <211> 484 <212> PRT <213> Unknown <220> <223> Source unknown <400> 17 Gly Ser Val Pro Val Asn Gly Thr Met Met Gln Tyr Phe Glu Trp Tyr 5 15

Leu Pro Asp Asp Gly Thr Leu Trp Thr Lys Val Ala Asn Asn Ala Gln

Ser	Leu	Ala 35	Asn	Leu	Gly	Ile	Thr 40	Ala	Leu	Trp	Leu	Pro 45	Pro	Ala	Tyr
Lys	Gly 50	Thr	Ser	Ser	Ser	Asp 55	Val	Gly	Tyr	Gly	Val 60	Tyr	Asp	Leu	Tyr
Asp 65	Leu	Gly	Glu	Phe	Asn 70	Gln	Lys	Gly	Thr	Val 75	Arg	Thr	Lys	Tyr	Gly 80
Thr	Lys	Thr	Gln	Tyr 85	Ile	Gln	Ala	Ile	Gln 90	Ala	Ala	His	Thr	Ala 95	Gly
Met	Gln	Val	Tyr 100	Ala	Asp	Val	Val	Phe 105	Asn	His	Lys	Ala	Gly 110	Ala	Asp
Gly	Thr	Glu 115	Leu	Val	Asp	Ala	Val 120	Glu	Val	Asn	Pro	Ser 125	Asp	Arg	Asn
Gln	Glu 130	Ile	Ser	Gly	Thr	Tyr 135	Gln	Ile	Gln	Ala	Trp 140	Thr	Lys	Phe	Asp
Phe 145	Pro	Gly	Arg	Gly	Asn 150	Thr	Tyr	Ser	Ser	Phe 155	Lys	Trp	Arg	Trp	Tyr 160
His	Phe	Asp	Gly	Thr 165	Asp	Trp	Asp	Glu	Ser 170	Arg	Lys	Leu	Asn	Arg 175	Ile
Tyr	Lys	Phe	Arg 180	Gly	Thr	Gly	Lys	Ala 185	Trp	Asp	Trp	Glu	Val 190	Asp	Thr
Glu	Asn	Gly 195	Asn	Tyr	Asp	Tyr	Leu 200	Met	Tyr	Ala	Asp	Leu 205	Asp	Met	Asp
His	Pro 210	Glu	Val	Val	Ser	Glu 215	Leu	Lys	Asn	Trp	Gly 220	Lys	Trp	Tyr	Val
Thr 225	Thr	Thr	Asn	Ile	Asp 230	Gly	Phe	Arg	Leu	Asp 235	Ala	Val	Lys	His	Ile 240
Lys	Tyr	Ser	Phe	Phe 245	Pro	Asp	Trp	Leu	Ser 250	Tyr	Val	Arg	Thr	Gln 255	Thr

Gln Lys Pro Leu Phe Ala Val Gly Glu Phe Trp Ser Tyr Asp Ile Asn Lys Leu His Asn Tyr Ile Thr Lys Thr Asn Gly Ser Met Ser Leu Phe Asp Ala Pro Leu His Asn Asn Phe Tyr Ile Ala Ser Lys Ser Gly Gly Tyr Phe Asp Met Arg Thr Leu Leu Asn Asn Thr Leu Met Lys Asp Gln Pro Thr Leu Ser Val Thr Leu Val Asp Asn His Asp Thr Glu Pro Gly Gln Ser Leu Gln Ser Trp Val Glu Pro Trp Phe Lys Pro Leu Ala Tyr Ala Phe Ile Leu Thr Arg Gln Glu Gly Tyr Pro Cys Ile Phe Tyr Gly Asp Tyr Tyr Gly Ile Pro Lys Tyr Asn Ile Pro Ala Leu Lys Ser Lys Leu Asp Pro Leu Leu Ile Ala Arg Arg Asp Tyr Ala Tyr Gly Thr Gln His Asp Tyr Ile Asp Asn Ala Asp Ile Ile Gly Trp Thr Arg Glu Gly Val Ala Glu Lys Ala Asn Ser Gly Leu Ala Ala Leu Ile Thr Asp Gly Pro Gly Gly Ser Lys Trp Met Tyr Val Gly Lys Gln His Ala Gly Lys Thr Phe Tyr Asp Leu Thr Gly Asn Arg Ser Asp Thr Val Thr Ile Asn Ala Asp Gly Trp Gly Glu Phe Lys Val Asn Gly Gly Ser Val Ser Ile 

Trp Val Pro Lys

<210> 18

<211> 485

<212> PRT

<213> Unknown

<220>

<223> Source unknown

<400> 18

Ala Asn Thr Ala Pro Ile Asn Glu Thr Met Met Gln Tyr Phe Glu Trp  $1 \hspace{1cm} 5 \hspace{1cm} 10 \hspace{1cm} 15$ 

Asp Leu Pro Asn Asp Gly Thr Leu Trp Thr Lys Val Lys Asn Glu Ala 20 25 30

Ala Asn Leu Ser Ser Leu Gly Ile Thr Ala Leu Trp Leu Pro Pro Ala 35 40 45

Tyr Lys Gly Thr Ser Gln Ser Asp Val Gly Tyr Gly Val Tyr Asp Leu 50 55 60

Tyr Asp Leu Gly Glu Phe Asn Gln Lys Gly Thr Ile Arg Thr Lys Tyr 65 70 75 80

Gly Thr Lys Thr Gln Tyr Ile Gln Ala Ile Gln Ala Ala Lys Ala Ala 85 90 95

Gly Met Gln Val Tyr Ala Asp Val Val Phe Asn His Lys Ala Gly Ala 100 105 110

Asp Gly Thr Glu Phe Val Asp Ala Val Glu Val Asp Pro Ser Asn Arg 115 120 125

Asn Gln Glu Thr Ser Gly Thr Tyr Gln Ile Gln Ala Trp Thr Lys Phe 130 135 140

Asp Phe Pro Gly Arg Gly Asn Thr Tyr Ser Ser Phe Lys Trp Arg Trp 145 150 155 160

Tyr His Phe Asp Gly Thr Asp Trp Asp Glu Ser Arg Lys Leu Asn Arg 165 170 175

Ile Tyr Lys Phe Arg Ser Thr Gly Lys Ala Trp Asp Trp Glu Val Asp Thr Glu Asn Gly Asn Tyr Asp Tyr Leu Met Phe Ala Asp Leu Asp Met Asp His Pro Glu Val Val Thr Glu Leu Lys Asn Trp Gly Thr Trp Tyr Val Asn Thr Thr Asn Ile Asp Gly Phe Arg Leu Asp Ala Val Lys His Ile Lys Tyr Ser Phe Phe Pro Asp Trp Leu Thr Tyr Val Arg Asn Gln Thr Gly Lys Asn Leu Phe Ala Val Gly Glu Phe Trp Ser Tyr Asp Val Asn Lys Leu His Asn Tyr Ile Thr Lys Thr Asn Gly Ser Met Ser Leu Phe Asp Ala Pro Leu His Asn Asn Phe Tyr Thr Ala Ser Lys Ser Ser Gly Tyr Phe Asp Met Arg Tyr Leu Leu Asn Asn Thr Leu Met Lys Asp Gln Pro Ser Leu Ala Val Thr Leu Val Asp Asn His Asp Thr Gln Pro Gly Gln Ser Leu Gln Ser Trp Val Glu Pro Trp Phe Lys Pro Leu Ala Tyr Ala Phe Ile Leu Thr Arg Gln Glu Gly Tyr Pro Cys Val Phe Tyr Gly Asp Tyr Tyr Gly Ile Pro Lys Tyr Asn Ile Pro Gly Leu Lys Ser Lys Ile Asp Pro Leu Leu Ile Ala Arg Arg Asp Tyr Ala Tyr Gly Thr 

Gln Arg Asp Tyr Ile Asp His Gln Asp Ile Ile Gly Trp Thr Arg Glu 415 ...
Gly Ile Asp Thr Lys Pro Asn Ser Gly Leu Ala Ala Leu Ile Thr Asp 420

Gly Pro Gly Gly Ser Lys Trp Met Tyr Val Gly Lys Lys His Ala Gly 435 440 445

Lys Val Phe Tyr Asp Leu Thr Gly Asn Arg Ser Asp Thr Val Thr Ile 450 455 460

Asn Ala Asp Gly Trp Gly Glu Phe Lys Val Asn Gly Gly Ser Val Ser 465 470 475 480

Ile Trp Val Ala Lys 485

<210> 19 <211> 619 <212> PRT <213> Bacillus flavothermus

<400> 19

Met Ser Leu Phe Lys Lys Ser Phe Pro Trp Ile Leu Ser Leu Leu Leu 1 5 10 15

Leu Phe Ser Phe Ile Ala Pro Phe Ser Ile Gln Thr Glu Lys Val Arg 20 25 30

Ala Gly Ser Val Pro Val Asn Gly Thr Met Met Gln Tyr Phe Glu Trp 35 40 45

Tyr Leu Pro Asp Asp Gly Thr Leu Trp Thr Lys Val Ala Asn Asn Ala 50 55 60

Gln Ser Leu Ala Asn Leu Gly Ile Thr Ala Leu Trp Leu Pro Pro Ala 65 70 75 80

Tyr Lys Gly Thr Ser Ser Ser Asp Val Gly Tyr Gly Val Tyr Asp Leu 85 90 95

Tyr Asp Leu Gly Glu Phe Asn Gln Lys Gly Thr Val Arg Thr Lys Tyr 100 105 110

Gly Thr Lys Thr Gln Tyr Ile Gln Ala Ile Gln Ala Ala His Thr Ala Gly Met Gln Val Tyr Ala Asp Val Val Phe Asn His Lys Ala Gly Ala Asp Gly Thr Glu Leu Val Asp Ala Val Glu Val Asn Pro Ser Asp Arg Asn Gln Glu Ile Ser Gly Thr Tyr Gln Ile Gln Ala Trp Thr Lys Phe Asp Phe Pro Gly Arg Gly Asn Thr Tyr Ser Ser Phe Lys Trp Arg Trp Tyr His Phe Asp Gly Thr Asp Trp Asp Glu Ser Arg Lys Leu Asn Arg Ile Tyr Lys Phe Arg Gly Thr Gly Lys Ala Trp Asp Trp Glu Val Asp Thr Glu Asn Gly Asn Tyr Asp Tyr Leu Met Tyr Ala Asp Leu Asp Met Asp His Pro Glu Val Val Ser Glu Leu Lys Asn Trp Gly Lys Trp Tyr Val Thr Thr Asn Ile Asp Gly Phe Arg Leu Asp Ala Val Lys His Ile Lys Tyr Ser Phe Phe Pro Asp Trp Leu Ser Tyr Val Arg Thr Gln Thr Gln Lys Pro Leu Phe Ala Val Gly Glu Phe Trp Ser Tyr Asp Ile Ser Lys Leu His Asn Tyr Ile Thr Lys Thr Asn Gly Ser Met Ser Leu Phe Asp Ala Pro Leu His Asn Asn Phe Tyr Ile Ala Ser Lys Ser Gly 

Gly Tyr Phe Asp Met Arg Thr Leu Leu Asn Asn Thr Leu Met Lys Asp Gln Pro Thr Leu Ala Val Thr Leu Val Asp Asn His Asp Thr Glu Pro Gly Gln Ser Leu Gln Ser Trp Val Glu Pro Trp Phe Lys Pro Leu Ala Tyr Ala Phe Ile Leu Thr Arg Gln Glu Gly Tyr Pro Cys Val Phe Tyr Gly Asp Tyr Tyr Gly Ile Pro Lys Tyr Asn Ile Pro Ala Leu Lys Ser Lys Leu Asp Pro Leu Leu Ile Ala Arg Arg Asp Tyr Ala Tyr Gly Thr Gln His Asp Tyr Ile Asp Ser Ala Asp Ile Ile Gly Trp Thr Arg Glu Gly Val Ala Glu Lys Ala Asn Ser Gly Leu Ala Ala Leu Ile Thr Asp Gly Pro Gly Gly Ser Lys Trp Met Tyr Val Gly Lys Gln His Ala Gly Lys Thr Phe Tyr Asp Leu Thr Gly Asn Arg Ser Asp Thr Val Thr Ile Asn Ala Asp Gly Trp Gly Glu Phe Lys Val Asn Gly Gly Ser Val Ser Ile Trp Val Pro Lys Ile Ser Thr Thr Ser Gln Ile Thr Phe Thr Val Asn Asn Ala Thr Thr Val Trp Gly Gln Asn Val Tyr Val Val Gly Asn Ile Ser Gln Leu Gly Asn Trp Asp Pro Val His Ala Val Gln Met Thr 

Pro Ser Ser Tyr Pro Thr Trp Thr Val Thr Ile Pro Leu Leu Gln Gly 565 570 . 575

Gln Asn Ile Gln Phe Lys Phe Ile Lys Lys Asp Ser Ala Gly Asn Val 580 585 590

Ile Trp Glu Asp Ile Ser Asn Arg Thr Tyr Thr Val Pro Thr Ala Ala 595 600 605

Ser Gly Ala Tyr Thr Ala Ser Trp Asn Val Pro 610 615

<210> 20

<211> 613

<212> PRT

<213> Bacillus

<400> 20

Met Ser Tyr Leu Lys Lys Val Trp Leu Tyr Tyr Thr Ile Ile Ala Thr 1 5 10 15

Leu Ile Ile Ser Phe Phe Thr Pro Phe Ser Thr Ala Gln Ala Asn Thr 20 25 30

Ala Pro Val Asn Gly Thr Met Met Gln Tyr Phe Glu Trp Asp Leu Pro 35 40 45

Asn Asp Gly Thr Leu Trp Thr Lys Val Lys Asn Glu Ala Ser Ser Leu 50 55 60

Ser Ala Leu Gly Ile Thr Ala Leu Trp Leu Pro Pro Ala Tyr Lys Gly 70 75 80

Thr Ser Gln Ala Asp Val Gly Tyr Gly Val Tyr Asp Leu Tyr Asp Leu 85 90 95

Gly Glu Phe Asn Gln Lys Gly Thr Ile Arg Thr Lys Tyr Gly Thr Lys 100 105 110

Thr Gln Tyr Leu Gln Ala Ile Gln Ala Ala Lys Ser Ala Gly Met Gln
115 120 125

Val Tyr Ala Asp Val Val Phe Asn His Lys Ala Gly Ala Asp Ser Thr 130 135 140

Glu 145	Trp	Val	Asp	Ala	Val 150	Glu	Val	Asn	Pro	Ser 155	Asn	Arg	Asn	Gln	Glu 160
Thr	Ser	Gly	Thr	Tyr 165	Gln	Ile	Gln	Ala	Trp 170	Thr	Lys	Phe	Asp	Phe 175	Pro
Gly	Arg	Gly	Asn 180	Thr	Tyr	Ser	Ser	Phe 185	Lys	Trp	Arg	Trp	Tyr 190	His	Phe
Asp	Gly	Thr 195	Asp	Trp	Asp	Glu	Ser 200	Arg	Lys	Leu	Asn	Arg 205	Ile	Tyr	Lys
Phe	Arg 210	Gly	Thr	Gly	Lys	Ala 215	Trp	Asp	Trp	Glu	Val 220	Asp	Thr	Glu	Asn
Gly 225	Asn	Tyr	Asp	Tyr	Leu 230	Met	Phe	Ala	Asp	Leu 235	Asp	Met	Asp	His	Pro 240
Glu	Val	Val	Ala	Glu 245	Leu	Lys	Asn	Trp	Gly 250	Lys	Trp	Tyr	Val	Asn 255	Thr
Thr	Asn	Val	Asp 260	Gly	Phe	Arg	Leu	Asp 265	Ala	Val	Lys	His	Ile 270	Lys	Tyr
Ser	Phe	Phe 275	Pro	Asp	Trp	Leu	Ser 280	Tyr	Val	Arg	Asn	Gln 285	Thr	Gly	Lys
Asn	Leu 290	Phe	Ala	Val	Gly	Glu 295	Phe	Trp	Gly	Tyr	Asp 300	Val	Asn	Lys	Leu
His 305	Asn	Tyr	Ile	Thr	Lys 310	Thr	Asn	Gly	Ala	Met 315	Ser	Leu	Phe	Asp	Ala 320
Pro	Leu	His	Asn	Asn 325	Phe	Tyr	Ile	Ala	Ser 330	Lys	Ser	Ser	Gly	Tyr 335	Phe
Asp	Met	Arg	Tyr 340	Leu	Leu	Asn	Asn	Thr 345	Leu	Met	Lys	Asp	Gln 350	Pro	Ala
Leu	Ala	Val 355	Thr	Leu	Val	Asp	Asn 360	His	Asp	Thr	Gln	Pro 365	Gly	Gln	Ser

Leu	Gln 370	Ser	Trp	Val	Glu	Pro 375	Trp	Phe	Lys	Pro	Leu 380	Ala	Tyr	Ala	Phe
Ile 385	Leu	Thr	Arg	Gln	Glu 390	Gly	Tyr	Pro	Cys	Val 395	Phe	Tyr	Gly	Asp	Tyr 400
Tyr	Gly	Ile	Pro	Lys 405	Tyr	Asn	Ile	Pro	Gly 410	Leu	Lys	Ser	Lys	Ile 415	
Pro	Leu	Leu	Ile 420	Ala	Arg	Arg	Asp	Tyr 425	Ala	Tyr	Gly ·	Thr	Gln 430	Arg	Asp
Tyr	Ile	Asp 435	His	Gln	Asp	Ile	Ile 440	Gly	Trp	Thr	Arg	Glu 445	Gly	Ile	Asp
Ala	Lys 450	Pro	Asn	Ser	Gly	Leu 455	Ala	Ala	Leu	Ile	Thr 460	Asp	Gly	Pro	Gly
Gly 465	Ser	Lys	Trp	Met	Tyr 470	Val	Gly	Lys	Arg	His 475	Ala	Gly	Lys	Val	Phe 480
Tyr	Asp	Leu	Thr	Gly 485	Asn	Arg	Ser	Asp	Thr 490	Val	Thr	Ile	Asn	Ala 495	Asp
Gly	Trp	Gly	Glu 500	Phe	Lys	Val	Asn	Gly 505	Gly	Ser	Val	Ser	Ile 510	Trp	Val
Ala	Lys	Thr 515	Ser	Asn	Val	Thr	Phe 520	Thr	Val	Asn	Asn	Ala 525	Thr	Thr	Val
Tyr	Gly 530	Gln	Asn	Val	Tyr	Val 535	Val	Gly	Asn	Ile	Pro 540	Glu	Leu	Gly	Asn
Trp 545	Asn	Ile	Ala	Asn	Ala 550	Ile	Gln	Met	Thr	Pro 555	Ser	Ser	Tyr	Pro	Thr 560
ľrp	Lys	Thr	Thr	Val 565	Ser	Leu	Pro	Gln	Gly 570	Lys	Ala	Ile	Glu	Phe 575	Lys
Phe	Ile	Lys	Lys 580	Asp	Ser	Ala	Gly	Asn	Val	Ile	Trp	Glu	Asn	Ile	Ala

Asn Arg Thr Tyr Thr Val Pro Phe Ser Ser Thr Gly Ser Tyr Thr Ala 595 600 .605

Asn Trp Asn Val Pro 610

<210> 21

<211> 619

<212> PRT

<213> Alkaliphilic bacillus

<400> 21

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Leu Phe Ser Phe Ile Ala Pro Phe Ser Ile Gln Thr Glu Lys Val Arg 20 25 30

Ala Gly Ser Val Pro Val Asn Gly Thr Met Met Gln Tyr Phe Glu Trp
35 40 45

Tyr Leu Pro Asp Asp Gly Thr Leu Trp Thr Lys Val Ala Asn Asn Ala 50 55 60

Gln Ser Leu Ala Asn Leu Gly Ile Thr Ala Leu Trp Leu Pro Pro Ala 65 70 75 80

Tyr Lys Gly Thr Ser Ser Ser Asp Val Gly Tyr Gly Val Tyr Asp Leu 85 90 95

Tyr Asp Leu Gly Glu Phe Asn Gln Lys Gly Thr Val Arg Thr Lys Tyr 100 105 110

Gly Thr Lys Thr Gln Tyr Ile Gln Ala Ile Gln Ala Ala His Thr Ala 115 120 125

Gly Met Gln Val Tyr Ala Asp Val Val Phe Asn His Lys Ala Gly Ala 130 135 140

Asp Gly Thr Glu Leu Val Asp Ala Val Glu Val Asn Pro Ser Asp Arg 145 150 155 160

Asn Gln Glu Ile Ser Gly Thr Tyr Gln Ile Gln Ala Trp Thr Lys Phe 165 170 175

Asp	Phe	Pro	Gly 180	Arg	Gly	Asn	Thr	Tyr 185	Ser	Ser	Phe	Lys	Trp 190	Arg	Trp
Tyr	His	Phe 195	Asp	Gly	Thr	Asp	Trp 200	Asp	Glu	Ser	Arg	Lys 205	Leu	Asn	Arg
Ile	Tyr 210	Lys	Phe	Arg	Gly	Thr 215	Gly	Lys	Ala	Trp	Asp 220	Trp	Glu	Val	Asp
Thr 225	Glu	Asn	Gly	Asn	Tyr 230	Asp	Tyr	Leu	Met	Tyr 235	Ala	Asp	Leu	Asp	Met 240
Asp	His	Pro	Glu	Val 245	Val	Ser	Glu	Leu	Lys 250	Asn	Trp	Gly	Lys	Trp 255	Tyr
Val	Ile	Thr	Thr 260	Asn	Ile	Asp	Gly	Phe 265	Arg	Leu	Asp	Ala	Val 270	Lys	His
Ile	Lys	Tyr 275	Ser	Phe	Phe	Pro	Asp 280	Trp	Leu	Ser	Tyr	Leu 285	Arg	Thr	Gln
Thr	Gln 290	Lys	Pro	Leu	Phe	Ala 295	Val	Gly	Glu	Phe	Trp 300	Ser	Tyr	Asp	Ile
Asn 305	Lys	Leu	His	Asn	Tyr 310	Ile	Thr	Lys	Thr	Asn 315	Gly	Ser	Met	Ser	Leu 320
Phe	Asp	Ala	Pro	Leu 325	His	Asn	Asn	Phe	Tyr 330	Ile	Ala	Ser	Lys	Ser 335	Gly
Gly	Tyr	Phe	Asp 340	Met	Arg	Thr	Leu	Leu 345	Asn	Asn	Thr	Leu	Met 350	Lys	Gľu
Gln	Pro	Thr 355	Leu	Ser	Val	Thr	Leu 360	Val	Asp	Asn	His	Asp 365	Thr	Glu	Pro
Gly	Gln 370	Ser	Leu	Gln	Ser	Trp 375	Val	Glu	Pro	Trp	Phe 380	Lys	Pro	Leu	Ala
Tyr 385	Ala	Phe	Ile	Leu	Thr 390	Arg	Gln	Glu	Gly	Tyr 395	Pro	Cys	Val	Phe	Tyr

Gly	Asp	Tyr	Tyr	Gly 405	Ile	Pro	Lys	Tyr	Asn 410	Ile	Pro	Ala	Leu	Lys 415	Ser
Lys	Leu	Asp	Pro 420	Leu	Leu	Ile	Ala	Arg 425	Arg	Asp	Tyr	Ala	Tyr 430	Gly	Tḥr
Gln	His	Asp 435	Tyr	Ile	Asp	Asn	Ala 440	Asp	Ile	Ile	Gly	Trp 445	Thr	Arg	Glu
Gly	Val 450	Ala	Glu	Lys	Ala	Asn 455	Ser	Gly	Leu	Ala	Ala 460	Leu	Ile	Thr	Asp
Gly 465	Pro	Gly	Gly	Ser	Lys 470	Trp	Met	Tyr	Val	Gly 475	Lys	Gln	His	Ala	Gly 480
Lys	Thr	Phe	Tyr	Asp 485	Leu	Thr	Gly	Asn	Arg 490	Ser	Asp	Thr	Val	Thr 495	Ile
Asn	Ala	Asp	Gly 500	Trp	Gly	Glu	Phe	Lys 505	Val	Asn	Gly	Gly	Ser 510	Val	Ser
Ile	Trp	Val 515	Pro	Lys	Thr	Ser	Thr 520	Thr	Ser	Gln	Ile	Thr 525	Phe	Thr	Val
Asn	Asn 530	Ala	Thr	Thr	Val	Trp 535	Gly	Gln	Asn	Val	Tyr 540	Val	Val	Gly	Asn
Ile 545	Ser	Gln	Leu	Gly	Asn 550	Trp	Asp	Pro	Val	Asn 555	Ala	Val	Gln	Met	Thr 560
Pro	Ser	Ser	Tyr	Pro 565	Thr	Trp	Val	Val	Thr 570	Val	Pro	Leu	Pro	Gln 575	Ser
Gln	Asn	Ile	Gln 580	Phe	Lys	Phe	Ile	Lys 585	Lys	Asp	Gly	Ser	Gly 590	Asn	Val
Ile	Trp	Glu 595	Asn	Ile	Ser	Asn	Arg 600	Thr	Tyr	Thr	Val	Pro 605	Thr	Ala	Ala
Ser	Gly 610	Ala	Tyr	Thr	Ala	Asn 615	Trp	Asn	Val	Pro					

<210> 22

<211> 640

<212> PRT

<213> Aspergillus kawachii

<400> 22

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Tyr Phe Leu Leu Thr Asp Arg Phe Gly Arg Thr Asp Asn Ser Thr Thr 35 40 45

Ala Thr Cys Asn Thr Gly Asp Gln Ile Tyr Cys Gly Gly Ser Trp Gln 50 55 60

Gly Ile Ile Asn His Leu Asp Tyr Ile Gln Gly Met Gly Phe Thr Ala 65 70 75 80

Ile Trp Ile Ser Pro Ile Thr Glu Gln Leu Pro Gln Asp Thr Ser Asp 85 90 95

Gly Glu Ala Tyr His Gly Tyr Trp Gln Gln Lys Ile Tyr Tyr Val Asn 100 105 110

Ser Asn Phe Gly Thr Ala Asp Asp Leu Lys Ser Leu Ser Asp Ala Leu 115 120 125

His Ala Arg Gly Met Tyr Leu Met Val Asp Val Val Pro Asn His Met 130 135 140

Gly Tyr Ala Gly Asn Gly Asn Asp Val Asp Tyr Ser Val Phe Asp Pro 145 150 155 160

Phe Asp Ser Ser Ser Tyr Phe His Pro Tyr Cys Leu Ile Thr Asp Trp 165 170 175

Asp Asn Leu Thr Met Val Gln Asp Cys Trp Glu Gly Asp Thr Ile Val 180 185 190

Ser Leu Pro Asp Leu Asn Thr Thr Glu Thr Ala Val Arg Thr Ile Trp 195 200 205

Tyr	Asp 210	Trp	Vaľ	Ala	Asp	Leu 215	Val	Ser	Asn	Tyr	Ser 220		Asp	Gly	Leu
Arg 225	Ile	Asp	Ser	Val	Glu 230	Glu	Val	Glu	Pro	Asp 235	Phe	Phe	Pro	Gly	Tyr 240
Gln	Glu	Ala	Ala	Gly 245	Val	Tyr	Cys	Val	Gly 250	Glu	Val	Asp	Asn	Gly 255	Asn
Pro	Ala	Leu	Asp 260	Cys	Pro	Tyr	Gln	Lys 265	Tyr	Leu	Asp	Gly	Val 270	Leu	Asn
Tyr	Pro	Ile 275	Tyr	Trp	Gln	Leu	Leu 280	Tyr	Ala	Phe	Glu	Ser 285	Ser	Ser	Gly
Ser	Ile 290	Ser	Asn	Leu	Tyr	Asn 295	Met	Ile	Lys	Ser	Val 300	Ala	Ser	Asp	Cys
Ser 305	Asp	Pro	Thr	Leu	Leu 310	Gly	Asn	Phe	Ile	Glu 315	Asn	His	Asp	Asn	Pro 320
Arg	Phe	Ala	Ser	Tyr 325	Thr	Ser	Asp	Tyr	Ser 330	Gln	Ala	Lys	Asn	Val 335	Leu
Ser	Tyr	Ile	Phe 340	Leu	Ser	Asp	Gly	Ile 345	Pro	Ile	Val	Tyr	Ala 350	Gly	Glu
Glu	Gln	His 355	Tyr	Ser	Gly	Gly	Asp 360	Val	Pro	Tyr	Asn	Arg 365	Glu	Ala	Thr
Trp	Leu 370	Ser	Gly	Tyr	Asp	Thr 375	Ser	Ala	Glu	Leu	Tyr 380	Thr	Trp	Ile	Ala
Thr 385	Thr	Asn	Ala	Ile	Arg 390	Lys	Leu	Ala	Ile	Ser 395	Ala	Asp	Ser	Asp	Tyr 400
Ile	Thr	Tyr	Lys	Asn 405	Asp	Pro	Ile	Tyr	Thr 410	Asp	Ser	Asn	Thr	Ile 415	Ala
Met	Arg	Lys	Gly 420	Thr	Ser	Gly	Ser	Gln 425	Ile	Ile	Thr	Val	Leu 430	Ser	Asn

Lys	Gly	Ser 435	Ser	Gly	Ser	Ser	Tyr 440	Thr	Leu	Thr	Leu	Ser 445	Gly	Ser	Gly
Tyr	Thr 450	Ser	Gly	Thr	Lys	Leu 455	Ile	Glu	Ala	Tyr	Thr 460	Cys	Thr	Ser	Val
Thr 465	Val	Asp	Ser	Asn	Gly 470	Asp	Ile	Pro	Val	Pro 475	Met	Ala	Ser	Gly	Leu 480
Pro	Arg	Val	Leu	Leu 485	Pro	Ala	Ser	Val	Val 490	Asp	Ser	Ser	Ser	Leu 495	Cys
Gly	Gly	Ser	Gly 500	Asn	Thr	Thr	Thr	Thr 505	Thr	Thr	Ala	Ala	Thr 510	Ser	Thr
Ser	Lys	Ala 515	Thr	Thr	Ser	Ser	Ser 520	Ser	Ser	Ser	Ala	Ala 525	Ala	Thr	Thr
Ser	Ser 530	Ser	Cys	Thr	Ala	Thr 535	Ser	Thr	Thr	Leu	Pro 540	Ile	Thr	Phe	Glu
Glu 545	Leu	Val	Thr	Thr	Thr 550	Tyr	Gly	Glu	Glu	Val 555	Tyr	Leu	Ser	Gly	Ser 560
Ile	Ser	Gln	Leu	Gly 565	Glu	Trp	His	Thr	Ser 570	Asp	Ala	Val	Lys	Leu 575	Ser
Ala	Asp	Asp	Tyr 580	Thr	Ser	Ser	Asn	Pro 585	Glu	Trp	Ser	Val	Thr 590	Val	Ser
Leu	Pro	Val 595	Gly	Thr	Thr	Phe	Glu 600	Tyr	Lys	Phe	Ile	Lys 605	Val	Asp	Glu
Gly	Gly 610	Ser	Val	Thr	Trp	Glu 615	Ser	Asp	Pro	Asn	Arg 620	Glu	Tyr	Thr	Val
Pro 625	Glu	Cys	Gly	Ser	Gly 630	Ser	Gly	Glu	Thr	Val 635	Val	Asp	Thr	Trp	Arg 640